

heater when any of the following occurs:

- (i) The heat exchanger temperature exceeds safe limits.
- (ii) The ventilating air temperature exceeds safe limits.
- (iii) The combustion airflow becomes inadequate for safe operation.
- (iv) The ventilating airflow becomes inadequate for safe operation.

(2) The means of complying with paragraph (g)(1) of this section for any individual heater must—

- (i) Be independent of components serving any other heater, the heat output of which is essential for safe operation; and
- (ii) Keep the heater off until restarted by the crew.

(3) There must be means to warn the crew when any heater, the heat output of which is essential for safe operation, has been shut off by the automatic means prescribed in paragraph (g)(1) of this section.

(h) *Air intakes.* Each combustion and ventilating air intake must be located so that no flammable fluids or vapors can enter the heater system—

- (1) During normal operation; or
- (2) As a result of the malfunction of any other component.

(i) *Heater exhaust.* Each heater exhaust system must meet the requirements of §§ 27.1121 and 27.1123.

(1) Each exhaust shroud must be sealed so that no flammable fluids or hazardous quantities of vapors can reach the exhaust system through joints.

(2) No exhaust system may restrict the prompt relief of any backfire that, if so restricted, could cause heater failure.

(j) *Heater fuel systems.* Each heater fuel system must meet the powerplant fuel system requirements affecting safe heater operation. Each heater fuel system component in the ventilating airstream must be protected by shrouds so that no leakage from those components can enter the ventilating airstream.

(k) *Drains.* There must be means for safe drainage of any fuel that might accumulate in the combustion chamber or the heat exchanger.

(1) Each part of any drain that operates at high temperatures must be pro-

tected in the same manner as heater exhausts.

(2) Each drain must be protected against hazardous ice accumulation under any operating condition.

[Doc. No. 5074, 29 FR 15695, Nov. 24, 1964, as amended by Amdt. 27-23, 53 FR 34211, Sept. 2, 1988]

§ 27.861 Fire protection of structure, controls, and other parts.

Each part of the structure, controls, rotor mechanism, and other parts essential to a controlled landing that would be affected by powerplant fires must be fireproof or protected so they can perform their essential functions for at least 5 minutes under any foreseeable powerplant fire conditions.

[Amdt. 27-26, 55 FR 8001, Mar. 6, 1990]

§ 27.863 Flammable fluid fire protection.

(a) In each area where flammable fluids or vapors might escape by leakage of a fluid system, there must be means to minimize the probability of ignition of the fluids and vapors, and the resultant hazards if ignition does occur.

(b) Compliance with paragraph (a) of this section must be shown by analysis or tests, and the following factors must be considered:

(1) Possible sources and paths of fluid leakage, and means of detecting leakage.

(2) Flammability characteristics of fluids, including effects of any combustible or absorbing materials.

(3) Possible ignition sources, including electrical faults, overheating of equipment, and malfunctioning of protective devices.

(4) Means available for controlling or extinguishing a fire, such as stopping flow of fluids, shutting down equipment, fireproof containment, or use of extinguishing agents.

(5) Ability of rotorcraft components that are critical to safety of flight to withstand fire and heat.

(c) If action by the flight crew is required to prevent or counteract a fluid fire (e.g. equipment shutdown or actuation of a fire extinguisher) quick acting means must be provided to alert the crew.